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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/715,069 | 11/17/2003 | Bernhard Stellwag | MOH-P010057 | 3307 |
| 24131 7590 06/13/2008 LERNER GREENBERG STEMER LLP P O BOX 2480 HOLLYWOOD, FL 33022-2480 | | | | |
| EXAMINER MONDT, JOHANNES P | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 3663 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 06/13/2008 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/715,069

Applicant(s)

STELLWAG ET AL.

Examiner

JOHANNES P. MONDT

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 4, 6, 7, 9 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 6, 7, 9 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Amendment

1. Amendment filed 3/11/08 forms the basis for this Office Action. In said amendment Applicant amended the Specification and claims 6-7. Comments on "REMARKS" submitted with said Amendment are included below under "Response to Arguments".

Specification

2. The following is a quotation of U.S.C. 132(a):

Whenever, on examination, any claim for a patent is rejected, or any objection or requirement made, the Director shall notify the applicant thereof, stating the reasons for such rejection, or objection or requirement, together with such information and references as may be useful in judging of the propriety of continuing the prosecution of his application; and if after receiving such notice, the applicant persists in his claim for a patent, with or without amendment, the application shall be reexamined. No amendment shall introduce new matter into the disclosure of the invention.

3. The Amendment to the Specification is objected to under 35 U.S.C. 132(a): the primary system has not, in the original specification, been defined with such specificity as is set forth through said amendment to the Specification, and hence said Amendment constitutes new matter.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to for lack of a disclosure that is enabling because the range limitation on the required or desirable concentration, in particular the upper limit thereof, is based on experiments in which the radiation level is not determined. However, the optimum concentration of alcohol is dependent upon various factors including said radiation level (because the latter determines inter alia the operating temperature), which is, however, not claimed.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Aforementioned lack of enabling disclosure implies that the metes and bounds of the claimed invention are not properly delineated, and hence the claims are indefinite. In particular, it is not clear over which range of radiation level the range of alcohol concentration, as claimed, but as tested only without proper regard for the influence of the radiation level, results in the disclosed protection of components of the boiling water reactor.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. **Claims 1, 3, 4, 6, 7, 9 and 10** are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The radiation level and its influence on the concentration of ethanol required for the purpose of corrosion protection, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). In particular,

A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected under 35 U.S.C. 112, first paragraph, as not enabling. See MPEP § 2172.01 ("Unclaimed Essential Matter"). See also MPEP § 2164.08(c). Such essential matter may include missing elements, steps or necessary structural cooperative relationships of elements described by the applicant(s) as necessary to practice the invention.

In addition, a claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification may be rejected under 35 U.S.C. 112, second paragraph, for failure to point out and distinctly claim the invention. See *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976); *In re Collier*, 397 F.2d 1003, 158 USPQ 266 (CCPA 1968). >But see *Ex parte Nolden*, 149 USPQ 378, 380 (Bd. Pat. App. 1965) ("[I]t is not essential to a patentable combination that there be interdependency between the elements of the claimed device or that all the elements operate concurrently toward the desired result"); *Ex parte Huber*, 148 USPQ 447, 448-49 (Bd. Pat. App. 1965) (A claim does not necessarily fail to comply with 35 U.S.C. 112, second

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paragraph where the various elements do not function simultaneously, are not directly functionally related, do not directly inter-cooperate, and/or serve independent purposes).

In the specification, the range limitation on the required or desirable concentration, in particular the upper limit thereof, is based on experiments in which the radiation level is not determined. However, the optimum concentration of alcohol is dependent upon various factors including said radiation level (because the latter determines inter alia the operating temperature), which is, however, not claimed.

10. **Claims 1, 3, 4, 6, 7, 9 and 10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Aforementioned lack of enabling disclosure implies that the metes and bounds of the claimed invention are not properly delineated, and hence the claims are indefinite. In particular, it is not clear over which range of radiation level the range of alcohol concentration results in the disclosed protection of components of the boiling water reactor.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. **Claim 1, 3, 4, 6, 7 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Afanasiev et al (SU 653953) in view of Hettiarachchi (US 2002/010953 A1).

On claims 1 and 9: Afanasiev et al teach a method for protecting components of a primary system of boiling water reactor having a pressure vessel and a feedwater line opening out into the pressure vessel (see English abstract), the method comprising:

Metering alcohol (methanol, ethanol, propanol, e.g.) into the boiling water reactor to an alcohol concentration of from 10 to 10^5 $\mu\text{mol/kg}$ in a downcomer (see English Abstract). A *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art or when the ranges of a claimed composition do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. See MPEP 2144.05. In the underlying case the lack of overlap is less than any finite number, on the basis of which one of ordinary skill in the art would expect the same properties to be found in the prior art and in the claimed invention. Because Afanasiev et al teach that the advantage of the alcohol addition *in the given range* resides in the full suppression of the formation of

oxygen in water *during* radiolysis (see English summary, tenth paragraph on the second page), it would have been obvious to one of ordinary skill in the art to monitor said range and if needed meter additional alcohol to maintain said concentration in said range.

Afanasiev et al do not necessarily teach the limitation on the downcomer "extending downward at an opening of the feedwater line, with surfaces of the components being covered by no more than a native oxide layer".

However, said limitation would have been obvious in view of Hettiarachchi who, in a patent application drawn to corrosion protection of metal surfaces in a high-temperature water coolant based nuclear reactor such as BWR or PWR (col. 1), hence analogous art, teaches the downcomer 16 extending downward at an opening of the feedwater line (see Figure 1 and [0024]), with surfaces of the components being covered by no more than a native oxide layer (core shroud 18 is of stainless steel ([0024]), while conditions for native oxide layer only as provided by definition of native oxide layer given by applicants (specification, pages 6-7) are met (hence claim 9 is met), i.e., the corrosion potential is less than the critical potential of -230 mV (see his claims 14 and 17). The structural limitations taught by Hettiarachchi merely indicate a typical reactor configuration to which the method by Afanasiev et al may be applied, while both methods of Hettiarachchi and Afanasiev relate to metal corrosion protection (see Summary of Afanasiev, first sentence, and Hettiarachchi's abstract.

On claim 3: Hettiarachchi ([0001]) and Afanasiev (Abstract) protect against stress corrosion cracking.

On claim 4: Afanasiev et al feed the alcohol into a condensate or feedwater system and carry the alcohol into the primary system with the feedwater (Abstract; Table on page3 of Summary in English).

On claims 6-7: Although Afanasiev et al do not necessarily teach the further limitations defined by claims 6-7, it would have been obvious to include said further limitations in view of Hettiarachchi, who teaches doping the surfaces through addition to the feedwater, with platinum, which is a precious metal (see [0028]-[0050]). Motivation is the reduction of reducing species to achieve the benefits of producing a noble-metal oxide film thus replacing the corrosion-causing iron atoms (see [0056]).

13. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Afanasiev et al and Hettiarachchi as applied to claim 1 above, and further in view of Lee et al (4,559,109). As detailed above, claim 1 is unpatentable over Afanasiev et al in view of Hettiarachchi. Neither necessarily teach the further limitation defined by claim 10. However, it would have been obvious to include said further limitation in view of Lee et al, who, in a process to extract ethanol for recycling from an ethanol-water mixture in a vapor phase (title and abstract), hence in this regard analogous to Afanasiev et al and Hettiarachchi, teach the extraction of almost pure ethanol through what is evidently a conventional extractive distillation process (loc.cit.). *Motivation* to include the teaching by Lee et al derives from the relative expense associated with ethanol in comparison with water, while combination merely requires the same process to a similar ethanol-vapor mixture.

Response to Arguments

14. Applicant's arguments filed 3/11/08 have been fully considered but they are not entirely persuasive, although the ground of rejection is not maintained.

Applicants argument (pages 7-9) that the purpose of the '893 patent (for the record: the patent to Hettiarachchi is U.S. Patent 5,818,893, NOT 5,181,893 as erroneously stated on page 7 of Remarks) based on an alleged difference in the purpose of the method is not persuasive, because clearly the Pd concentration is not what is claimed, but instead it is the ethanol concentration that matters. The considerations in the Office Action on the Pd concentration are merely auxiliary in that they are used to infer a concentration of ethanol. Because ethanol is not deposited it is reasonably inferred from the teaching by Hettiarachchi that the ethanol concentration is maintained for some time to be in the range as claimed. Because the claim is extremely broadly formulated in that "maintained" is not in itself limited in duration, there is no error in the rejection. Even arguendo, the Pd concentration is evidently maintained for a long time during 48 hrs. of Pd injection (col. 10, l. 57+)

Applicant's further allegation of a "teaching away" (page 9) is wholly unsubstantiated and hence cannot be responded to on the specifics: suffice it to say that nowhere in Hettiarachchi a teaching of a subsequent reduction to levels of ethanol outside the claimed range prior to any interval over which such level is maintained can be found.

Examiner admits to a calculation error: the ratio of Pd atoms to ethanol molecules resulting from a correction of said ratio on line 14 of page 5 yields approximately 0.0002, from which, however, applicant draws a conclusion based on an incorrect interpretation of what is meant by "ppb": not mass ratio, but instead the ratio of the number of particles is so defined. Therefore, the lower end of the range of Pd concentration in water as disclosed by Hettiarachchi, that is: 1 ppb of Pd (see col. 9, l. 12+), corresponds to a concentration of 5000 ppb of ethanol. Because water is overwhelmingly the constitution of the liquid in which ethanol is dissolved, 1 kg of the solution contains 1,000/18 moles of water and hence contains $5,000 \times 10^{-9} \times 1,000/18$ moles of ethanol, i.e., 5,000/18 or 277 μ moles/kg. This is indeed outside the range as claimed. Accordingly, the rejection is herewith withdrawn.

However, upon further consideration and search a new rejection is provided based on Afanasiev et al (SU 653953 A).

Double Patenting

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

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be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

17. The provisional double-patenting rejection of claim 1 over claim 2 of co-pending Application 10/820,966 in view of Hirota et al (US 2001/0004962 A1) as set forth in the previous office action mailed 12/12/07 is herewith repeated, with the text of the rejection included by reference in its entirety. Claim 2 of said Application has not been amended.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHANNES P. MONDT whose telephone number is (571)272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Johannes P Mondt/
Primary Examiner, Art Unit 3663